

WHAT IS CLAIMED IS:

1. An engine start control method comprising:
determining whether a predetermined control condition is satisfied;
determining whether a counter value indicative of an accumulated number of
5 engine start delays due to leaked fuel is greater than a predetermined reference value;
injecting fuel and igniting air/fuel mixture until an engine speed reaches a
predetermined start determination engine speed, if it is determined that the counter
value is not greater than the predetermined reference value;
determining whether an elapsed time for the engine speed to reach the
10 predetermined start determination engine speed is greater than a predetermined target
start time;
increasing the counter value by 1 if the elapsed time is greater than the
predetermined required starting time, and decreasing the counter value by 1 if the
elapsed time is not greater than the predetermined target starting time; and
15 performing a leaked fuel reduction control logic, if it is determined that the
counter value is greater than the predetermined reference value.
2. The engine start control method of claim 1, wherein the predetermined
control condition comprises a battery voltage being higher than a predetermined voltage
and each of differences between a coolant temperature, an intake air temperature, and a
20 fuel temperature being less than a predetermined value.
3. The engine start control method of claim 1, wherein the predetermined
reference value of the accumulated number of engine start delays is 10.
4. The engine start control method of claim 1, wherein the predetermined
start determination engine speed is determined based on a coolant temperature.
- 25 5. The engine start control method of claim 1, wherein the predetermined
target start time is determined based on a fuel temperature.
6. The engine start control method of claim 1, wherein the leaked fuel
reduction control logic comprises:
controlling an injector to not inject fuel for a predetermined number of engine

cycles of an injection deactivation;

decreasing the counter value by 1, if an engine speed reaches the predetermined start determination engine speed during the predetermined number of engine cycles; and

5 increasing the counter value by 1, if the engine speed reaches the predetermined start determination engine speed after the predetermined number of engine cycles.

7. The engine start control method of claim 6, wherein the predetermined number of engine cycles of the injection deactivation is determined based on the counter value.

8. The engine start control method of claim 7, wherein the predetermined number of engine cycles is determined by a difference between the counter value and the predetermined reference value.

9. The engine start control method of claim 6, wherein the leaked fuel reduction control logic further comprises:

determining whether the counter value is equal to a predetermined maximum value; and

resetting the counter value to 0 and warning of a malfunction of the injector, if it is determined that the counter value is equal to the predetermined maximum value.

10. An engine start control system comprising:
an engine speed for sensor detecting an engine speed;
an injector for injecting fuel; and
a control unit for controlling the injector based on a signal of the engine speed sensor,

wherein the control unit is programmed to perform a control method comprising:

determining whether a predetermined control condition is satisfied;

determining whether a counter value indicative of an accumulated number of engine start delays due to leaked fuel is greater than a predetermined reference value;

injecting fuel and igniting air/fuel mixture until an engine speed reaches a predetermined start determination engine speed, if it is determined that the counter value is not greater than the predetermined reference value;

determining whether an elapsed time for the engine speed to reach the predetermined start determination engine speed is greater than a predetermined target start time;

increasing the counter value by 1 if the elapsed time is greater than the predetermined required starting time, and decreasing the counter value by 1 if the elapsed time is not greater than the predetermined target starting time; and

performing a leaked fuel reduction control logic, if it is determined that the counter value is greater than the predetermined reference value.

11. The engine start control system of claim 10, further comprising:
a battery voltage sensor detecting a battery voltage;

a coolant temperature sensor detecting a coolant temperature; and

a fuel temperature sensor detecting a fuel temperature,

wherein the predetermined control condition comprises a battery voltage being higher than a predetermined voltage and each of differences between a coolant temperature, an intake air temperature, and a fuel temperature being less than a predetermined value.

12. The engine start control system of claim 10, wherein the predetermined reference value is 10.

13. The engine start control system of claim 10, further comprising a coolant temperature sensor detecting a coolant temperature, wherein the predetermined start determination engine speed is determined based on a coolant temperature.

14. The engine start control system of claim 10, further comprising a fuel temperature sensor detecting a fuel temperature, wherein the predetermined target start time is determined based on a fuel temperature.

15. The engine start control system of claim 10, wherein the leaked fuel reduction control logic comprises:

controlling the injector to not inject fuel for a predetermined number of engine cycles of an engine deactivation;

decreasing the counter value by 1, if an engine speed reaches the predetermined start determination engine speed during the predetermined number of engine cycles; and

increasing the counter value by 1, if the engine speed reaches the predetermined start determination engine speed after the predetermined number of engine cycles.

16. The engine start control system of claim 15, wherein the predetermined number of engine cycles is determined based on the counter value.

17. The engine start control system of claim 16, wherein the predetermined number of engine cycles is determined by a difference between the counter value and the predetermined reference value.

18. The engine start control system of claim 15, wherein the leaked fuel reduction control logic further comprises:

determining whether the counter value is equal to a predetermined maximum value; and

resetting the counter value to 0 and warning of a malfunction of the injector, if it is determined that the counter value is equal to the predetermined maximum value.

19. An engine start control method comprising:
determining whether an accumulated number of cases in which engine start is determined to be delayed is greater than a predetermined reference value; and
controlling an injector to not inject fuel for a predetermined number of engine cycles.

20. The engine start control method of claim 19, wherein the engine start is determined to be delayed if an elapsed time for an engine speed to reach a predetermined start determination engine speed is greater than a predetermined target start time.

21. The engine start control method of claim 20, wherein the predetermined start determination engine speed is determined based on a coolant temperature.

22. The engine start control method of claim 20, wherein the predetermined target start time is determined based on a fuel temperature.

23. The engine start control method of claim 19, wherein the predetermined number of engine cycles of the injection deactivation is determined based on the counter value.

24. The engine start control method of claim 23, wherein the predetermined number of engine cycles is determined by a difference between the counter value and the predetermined reference value.

25. An engine start control system comprising:
at least one sensor for detecting engine operating conditions;
an injector for injecting fuel; and
a control unit for controlling the injector based on signals of the at least one sensor,
wherein the control unit is programmed to perform a control logic comprising:
determining whether an accumulated number of cases in which engine start is determined to be delayed is greater than a predetermined reference value; and
controlling the injector to not inject fuel for a predetermined number of engine cycles.

26. The engine start control system of claim 25, wherein the at least one sensor comprises an engine speed sensor detecting an engine speed, and wherein the engine start is determined to be delayed if an elapsed time for an engine speed to reach a predetermined start determination engine speed is greater than a predetermined target start time.

27. The engine start control system of claim 26, wherein the at least one sensor further comprises a coolant temperature sensor detecting a coolant temperature,

and wherein the predetermined start determination engine speed is determined based on a coolant temperature.

28. The engine start control system of claim 26, wherein the at least one sensor further comprises a fuel temperature sensor detecting a fuel temperature, and wherein the predetermined target start time is determined based on a fuel temperature.

29. The engine start control system of claim 25, wherein the predetermined target start time is determined based on a fuel temperature.

30. The engine start control system of claim 29, wherein the predetermined number of engine cycles is determined by a difference between the counter value and the predetermined reference value.